

meniscus coating method, a coating method using self-assembled monolayers, and a spray coating method.

17. The process according to Claim 2, wherein the polymeric  
5 material is a copolymer of 1,1'-dihydroperfluorooctyl methacrylate and t-butyl methacrylate.

18. The process according to Claim 1, wherein the exposed coating portion has a higher solubility in carbon dioxide relative to the unexposed  
10 coating portion, and wherein said step of subjecting the coating to a second composition comprising carbon dioxide comprises removing the exposed coating portion from the substrate such that the unexposed coating portion remains.

15 19. The process according to Claim 18, wherein the polymeric material comprises a fluoropolymer.

20. The process according to Claim 19, wherein the fluoropolymer is formed from monomers selected from the group consisting of fluoroacrylate monomers, fluorostyrene monomers, fluoroalkylene oxide monomers, fluorolefin monomers, fluorinated alkyl vinyl ether monomers, cyclic fluorinated monomers, and mixtures thereof.

21. The process according to Claim 20, wherein the monomers are selected from the group consisting of 2-(N-ethylperfluorooctane- sulfonamido) ethyl acrylate, 2-(N-ethylperfluorooctane- sulfonamido) ethyl methacrylate, 2-(N-methylperfluorooctane- sulfonamido) ethyl acrylate, 2-(N-methylperfluorooctane- sulfonamido) ethyl methacrylate, 1,1'-dihydroperfluorooctyl acrylate, 1,1'-dihydroperfluorooctyl methacrylate, 1,1',2,2'-tetrahydroperfluoroalkylacrylate, 1,1',2,2'-tetrahydroperfluoroalkylmethacrylate,  $\alpha$ -fluorostyrene, 2,4,6-trifluoromethylstyrene, hexafluoropropylene oxide, perfluorocyclohexane oxide, tetrafluoroethylene,

vinylidene fluoride, chlorotrifluoroethylene, perfluoro(propyl vinyl ether), perfluoro(methyl vinyl ether), 2,2-bis-trifluoromethyl-4,5-difluoro-1,3-dioxole, and mixtures thereof.

5        22. The process according to Claim 18, wherein the polymeric material comprises a silicon-containing polymer.

10      23. The process according to Claim 22, wherein the silicon-containing polymer comprises at least one segment selected from the group consisting of an alkyl siloxane, a fluoroalkyl siloxane, a chloroalkyl siloxane, and mixtures thereof.

15      24. The process according to Claim 18, wherein an intermediate layer is present between the coating portion and the substrate, and said process further comprising the step of selectively etching the intermediate layer using the developed coating portion as an etching mask.

20      25. The process according to Claim 24, wherein said step of selectively etching the intermediate layer comprises contacting the intermediate layer with a gas selected from the group consisting of oxygen, chlorine, fluorine, and mixtures thereof.

25      26. The process according to Claim 18, further comprising the steps of:

depositing a metal-containing material or an ionic material on the surface of the substrate from which the exposed or the unexposed coating portions were removed; and then

removing the exposed coating portion from the substrate.

30      27. The process according to Claim 26, wherein the metal-containing material comprises at least one metal selected from the group

consisting of aluminum, copper, gold, titanium, tantalum, tungsten, molybdenum, silver, and alloys thereof.

28. The process according to Claim 27, wherein the ionic material is  
5 selected from the group consisting of boron, phosphorous, arsenic, and combinations thereof.

29. The process according to Claim 18, wherein radiation is selected from the group consisting of visible, ultraviolet, X-ray, and e-beam.

10 30. The process according to Claim 18, wherein the radiation is ultraviolet or x-ray and the first composition comprises a photo acid generator.

15 31. The process according to Claim 18, wherein said step of removing the unexposed coating portion from the substrate comprises contacting the unexposed coating portion with a carbon dioxide containing fluid such that the unexposed coating portion is removed from the substrate.

20 32. The process according to Claim 18, wherein said step of contacting the substrate with a first composition comprising carbon dioxide and a component comprises coating the component using a method selected from the group consisting of a spin coating method, a dip coating method, a meniscus coating method, a coating method using self-assembled monolayers, and a spray coating method.

25 33. The process according to Claim 18, wherein the component includes a polymeric material is selected from the group consisting of a copolymer of a fluoroacrylate and a component selected from the group consisting of  $C(CH_2OH)_3$ , a sugar unit, and  $SiR_3$  wherein R is a polar group  
30 selected from the group consisting of: